The Quantum Collective Blog v.2.0
http://quantumcollective.org

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Contents

Note: Blue denotes hyperlinked text.

Contents (cont.)

Overview of the blog.

The Quantum Collective
An experiment in collaboration building

The notion of building an interconnected online collaboration network is not a new idea for physicists, who have always played a crucial and persistent role in the development of the internet and world wide web. In the twenty-first century, the tools of the web and internet are ubiquitous in all arenas of human activity, and physics research is no exception. We have become dependent on the ease of communication with colleagues using email, the one-click instant availability of preprints and publications on file servers, as well as a myriad of online research tools such as the Web of Science.

In spite of the pervasiveness of these tools in research, there remains a sizable gap between the extraordinary impact present-day internet technologies can have on the growth and development of long-distance collaborations, and the actual use of these technologies by physicists for this purpose in practice*.

* D. Butler, *Science in the web age: Joint efforts,* Nature **438**, 548 (2005).

The Quantum Collective (The QC) was created to help bridge this gap by consolidating together a set of information-sharing tools into a secure, cross-platform, and easy-to-use web-based utility called a blog. The features available on The QC include:

- Restricted access to the site via a firewall requiring user authentication.
- An easy-to-use web-based text editor that supports tex; html knowledge is not required.
- File uploading and insertion directly into post.
- Support for posting via email.
- Blog database is archived and fully searchable.

Our blog is powered by a widely-used open-source blogging program called Wordpress and is running on a server maintained by Bluehost, a popular web-hosting company who provide nightly backups, ssh access, and a feature-rich control panel for site administration.

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Who's using the blog?

This group can be expanded to include more colleagues.

N. Nygaard

D. Feder

B. Reinhardt

G. Brennen
G. Pupillo

A.M. Rey

L. Carr

M. Safronova

NIST*

T. Nikuni

L. Collins

M. Edwards

M.J. Davis

* "NIST" signifies the groups of C.W. Clark, P.S. Julienne, W.D. Phillips, and C.J. Williams, as well as associates of NIST, i.e. Z. Dutton, I.I. Satija, and B.I. Schneider.

B. Blakie

The yin and yang of a successful collaboration blog

The QC blog is constructed to facilitate collaboration between a trusted network of colleagues. As a member of this community, you play a dual role as both *provider* and *seeker* of knowledge and ideas.

Typical *provider* activities

Posting to the blog

• Post your latest results, such as a set of pdf notes or a jpg image showing a graph of a recent calculation or experiment.

• Draw your colleagues' attention to a recent preprint or publication in your field.

• Share resources with your collaborators, such as data and computer code.

Writing comments to a post

• Share your expertise by answering a question posted by a colleague.

• Provide feedback about the latest results or an idea posted by a colleague.

Typical *seeker* activities

Read the blog daily

• Use the blog to stay tuned-in to your colleagues' latest activities.

• Make use of the resources available on the blog, such as data and computer code.

Posting to the blog

• Post an idea or question to get input from the group.

Writing comments to a post

• Raise followup questions to a colleague's post or comment.

Three key challenges to overcome

The success of The QC blog as a lasting resource for collaboration building hinges on three primary factors

1. The **active participation** of each individual.

2. The efficacy of the blog technology to provide **hassle-free** sharing of knowledge.

3. The ability to balance **openness** and growth on one hand with **privacy** and stability on the other.

We have already touched upon the first two issues. Although it is not yet clear if these requirements will be easily met, **we at least are familiar with the principles involved for the first two**, i.e. if we work hard enough we can improve the blog apparatus and if we make this endeavor a priority, we can commit the time it takes to stay actively involved.

With the **third issue**, however, we are moving into a **less familiar and somewhat unpredictable territory:** Who do we invite to join and who do we exclude? What criteria do we use? At what point do we stop inviting our colleagues to join this collective endeavor? Is there an optimal size for a collaboration network? What are the risks involved with sharing information openly before our work is published? Is this fundamentally different than giving a public lecture before publishing our work? If colleague A helps colleague B in some form on the blog, what is the proper way for B to acknowledge A? When does an acknowledgment evolve into a co-authorship? Etc, etc, etc...

I do not have answers to these important questions. That is why The QC is an experiment. We won't know if this can succeed unless we try!
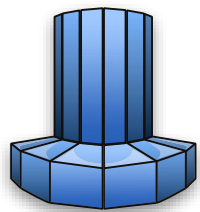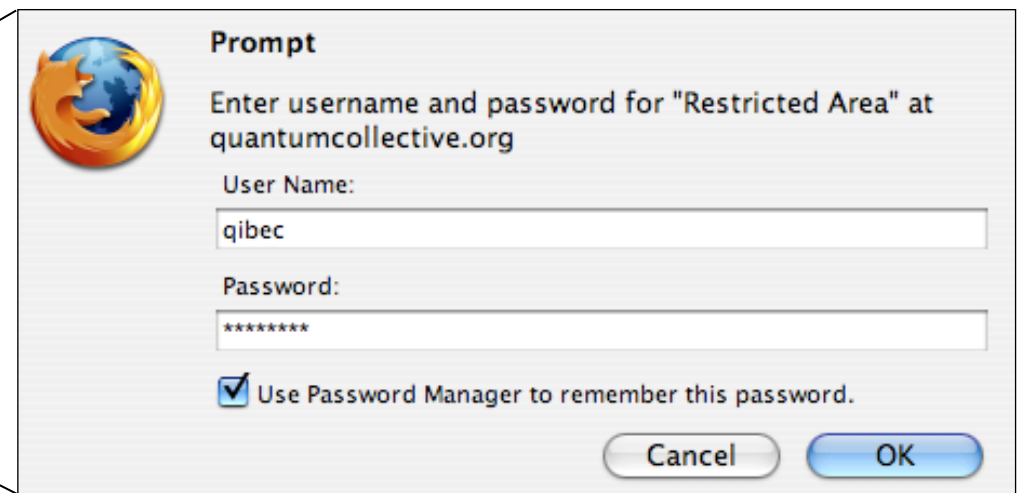
Accessing the blog.

The Firewall

1. Type http://quantumcollective.org into your browser (bookmark it).

http://quantumcollective.org
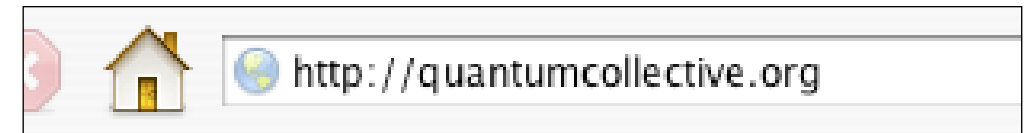
2. Type in the firewall username and password* when prompted.

Prompt

Enter username and password for "Restricted Area" at quantumcollective.org

User Name:
qibec

Password:
****

☑ Use Password Manager to remember this password.

Cancel   OK
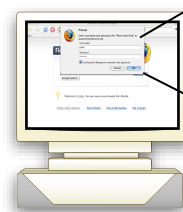
quantumcollective.org
(a Bluehost.com server)

your computer

* The firewall password will change every 6 months for added security.

3. You will be taken directly to the QC blog and may begin reading.

The Quantum Collective

A virtual workspace for explorations into complex quantum dynamical systems.

January 13, 2006

Weekly Highlights

a   b   c

I'm starting something new today. At the end of each week, I will post links to preprints on the arxiv, as well as any Science or Nature articles, which appeared over the past week and seem relevant to us. Any suggestions are welcome.

Bose and Fermi Gases

Experiment

T. Stöferle et al., *Fermionic atoms with tunable interactions in a 3D optical lattice*, cond-mat/0601045.

Login

Login:

Password:

Login »

Search

Search

Resources
QIBEC Seminar Schedule
MPDToolbox
Atomic Data

Categories
Article Highlights
Blog Mechancis
Experiments
Group Meeting Notes
MPD Toolbox
Topics
Feshbach resonances

Logging in to the blog

In order to post an entry on the blog, you first must log in using your individual username and password.
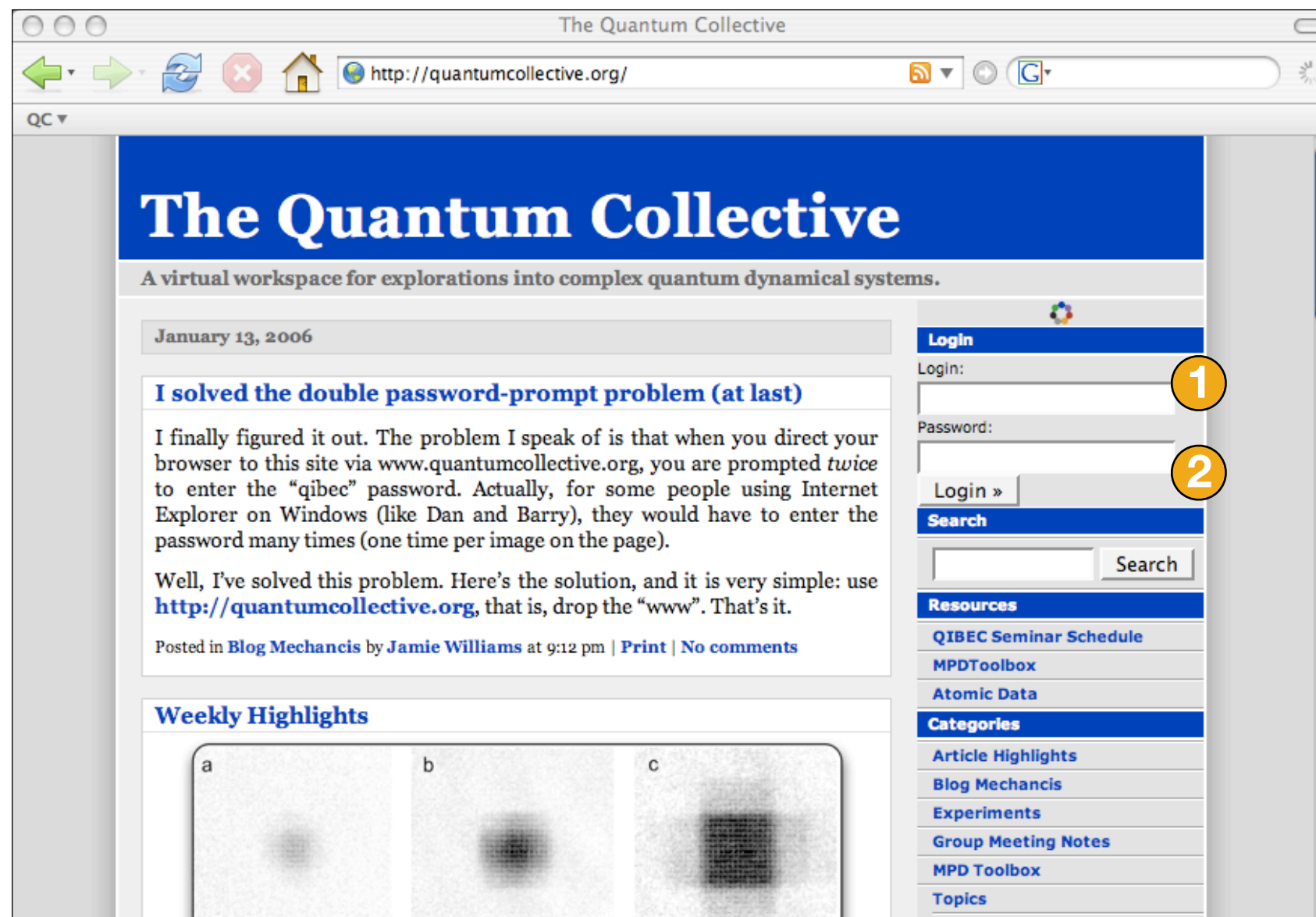
1 Your username goes here, e.g. john_doe. This name is assigned to you by the blog administrator.

2 Your password goes here. Initially, this is "changeme". You should change it after you log in for the first time.

Reading the blog.

The three parts of the blog

The blog is divided into three parts:
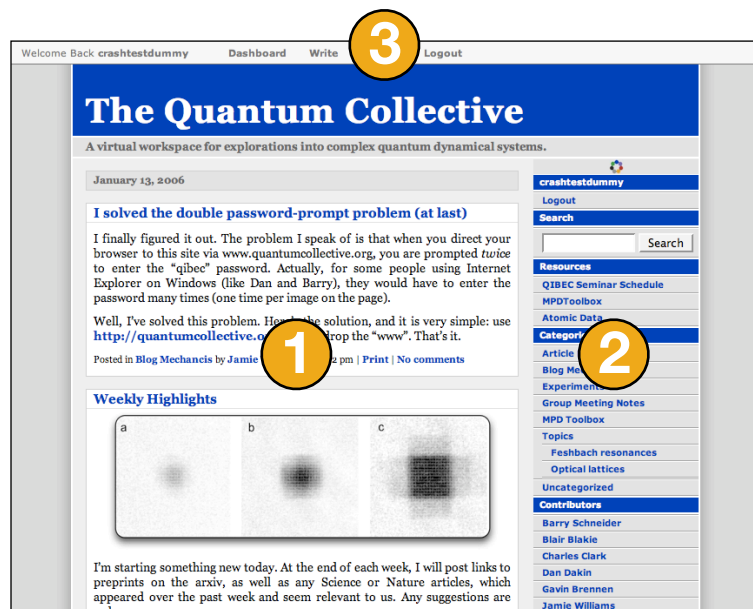
① Daily content
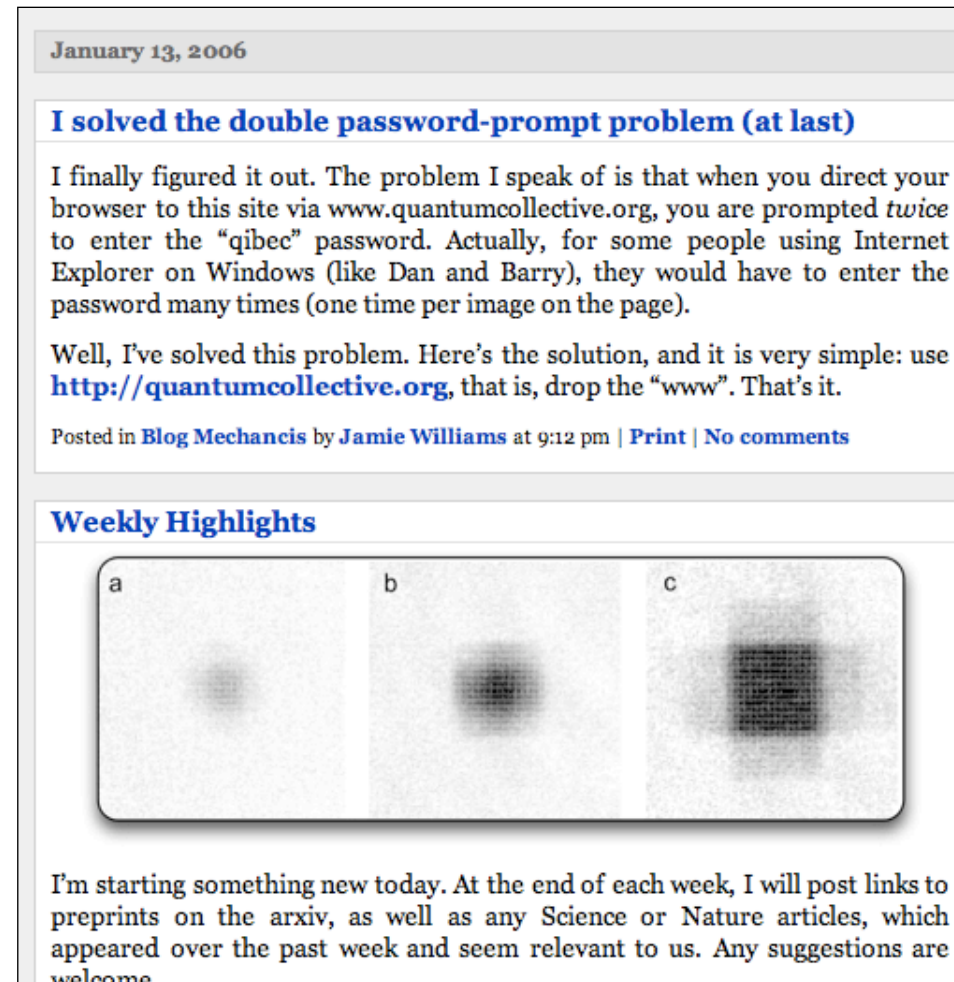
② Navigational sidebar
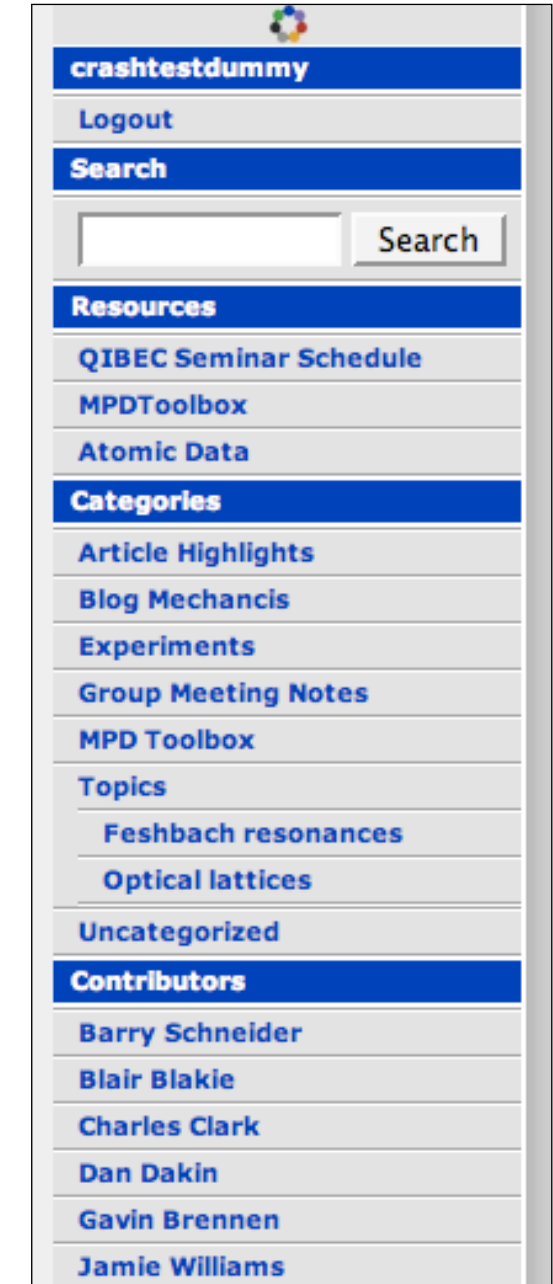
③ Admin toolbar (to manage your posts and settings)

1. Daily content

December 18, 2005 (1)
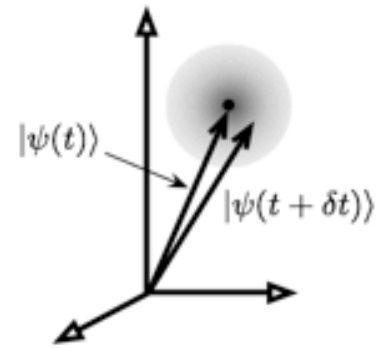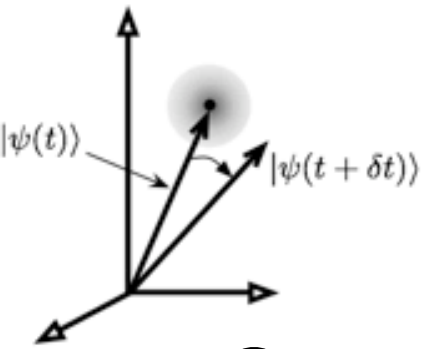
Decay of the wavefunction norm: some advice (2)

A couple of weeks ago at our group meeting, we discussed the fact that in some of the simulations Ippei and I have done, the number of particles changed by a percent or so. Ippei showed that the error decreases when the Schmidt cutoff is increased and when the time step is decreased. Last week we tracked down the source of this error, which I illustrate in the figure below. We can think of the MPD as a kind of truncated basis expansion, with the optimal basis forming a smaller subspace in the Hilbert space. The radius of this subspace is proportional to the cutoff chi. In each time step, a new basis is found, so the subspace evolves in time along with the wavefunction. However, you can run into problems if the time step is too large or the cutoff is too small, as in Fig. A. In this case, the wavefunction evolves too quickly for the adaptive basis expansion to keep up and so the wavefunction can not be completely reconstructed. As a result, the norm can decay a bit in each timestep. This is what we were seeing. (3)

It's good to learn that the error in the number was not a bug in the code, but rather an intrinsic error of the MPD method, which can be avoided by choosing a larger cutoff and/or smaller time step, as in Fig. B.

large time step, δt, small χ small time step, δt, large χ

$|\psi(t)\rangle$ $|\psi(t+\delta t)\rangle$ (4) $|\psi(t)\rangle$ $|\psi(t+\delta t)\rangle$

(A)   (5)   (B)

Posted in **MPD Toolbox** by **Jamie Williams** at 10:58 pm | **Print** | **No comments**
(6)   (7)   (8)

1 Date the post first appeared on the blog.

2 Title of post, linked to permalink page.

3 Body of the post. Supports LaTeX.

4 Image file (e.g. jpg, gif, png).

5 Category of post, linked to a page displaying all entries in that category.

6 Author, linked to mailto:email@address.

7 Clicking "Print" displays a stripped-down version of the post for printing.

8 Displays number of comments, if any; linked to the permalink page.

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Writing a comment to a post

Clicking on the title or comment tag of the article on the main page takes you to the "permalink" page displaying only that post **1** and its comments **2**.

3 If you would like to be notified by email when a new comment appears, enter your email and click "Subscribe".

4 You can leave a comment to a post by typing in your text in this window, then clicking "Submit Comment." Check this box **5** if you would like to be notified by email when new comments appear for this post.

2. Navigational sidebar

1 Login info (after logging in, displays username and Logout option).

2 Search panel. The entire blog database is searchable.

3 Various community resources (schedules, data, code, etc).

4 Categories. Each item is linked to a page displaying all articles in that category. The blog administrator can add new categories if requested to do so.

5 Contributors. Lists everyone who has posted to the blog. Each item is linked to a page displaying all articles posted by that person.

6 Links to the RSS feeds. Note: your feed reader must support password protection or it won't get past the firewall.

7 Calendar for accessing the blog's archives.

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3. Admin toolbar
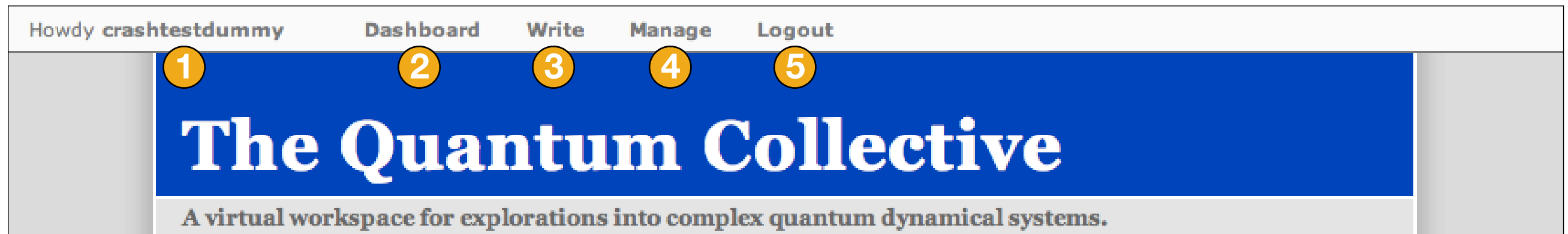
1 Your username.

2 This takes you directly to the "Dashboard" section of the admin area.

3 Takes you directly into the "Write" section of the admin area, where you can compose you post.

4 This takes you directly to the "Manage" section of the admin area, giving you easy access to all of your posts for editing.

5 To log out of the blog entirely, click here.

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Posting to the blog.

Stepping behind the blog into the admin area

Clicking on a link on the admin toolbar takes you to the Wordpress admin area of the blog, where you can manage your posts and profile.

This is the "Dashboard" section.

Click here to go back to the blog.

Click here to write a post for the blog.

Writing a post.

1 Title of post goes here.

2 Typesetting toolbar.
(does not show up on Safari).

3 Type in your message here. Wordpress will automatically convert your text into html code when you are finished.

4 You can password-protect your post (not necessary).

5 Assign relevant categories to your post.

6 You can upload and insert images or files with this tool.

7 When you are finished click "Publish".

Using LaTeX in your post.

A useful feature of our blog is the support for LaTeX typesetting. Whenever you want to enter a LaTeX command, insert the code between the following markers, e.g.

[tex] `\alpha \beta \gamma` [/tex]

When you click "Publish" after writing your message, Wordpress uses a plugin utility called latexrender that interprets your LaTeX code and renders the formula as a gif image, which then is placed directly into your post.

A potential problem can arise when a character conflicts with the html post-processing done by Wordpress.

Known examples are:

- "&" must be entered as "&"

- line breaks (or carriage returns) get replace by
 (this is bad).

Uploading and inserting a file into your post.

1 Click "Browse..." to locate the disired file on your local hard disk.

2 Enter title and description if you want.

3 Click "Upload" to send the file to The QC server.
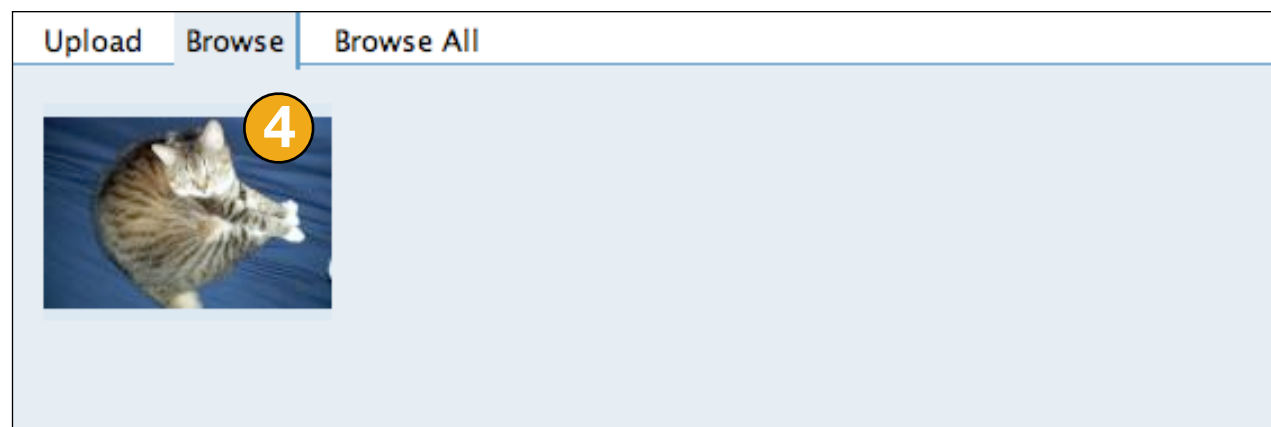
4 The file will appear in the "Browse" menu.
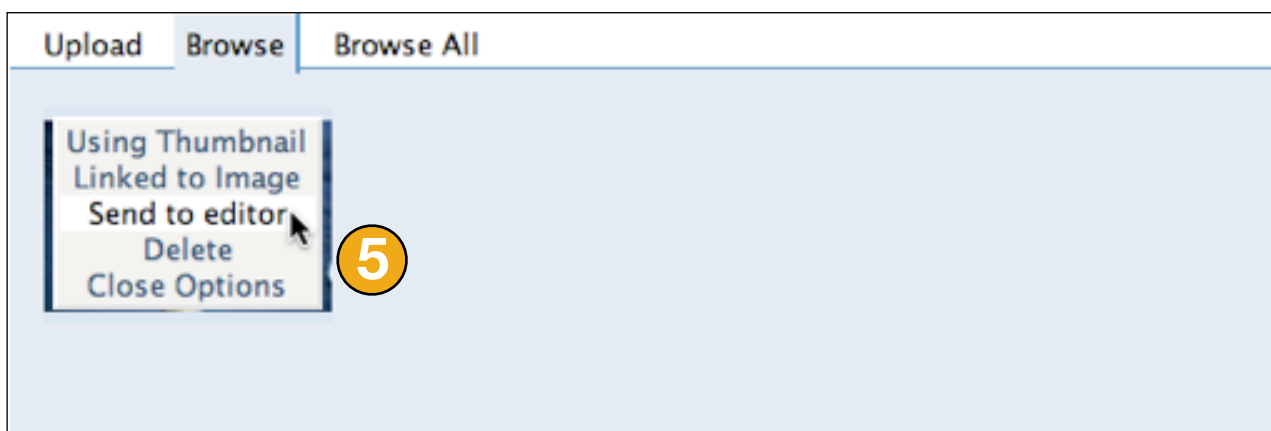
Click on the file. Five options appear. The desired choices for most cases **5** are: "Using Thumbnail" and "Linked to Image". Then click "Send to Editor" to insert it into your post.

Uploading and inserting a file into your post.

1 After clicking "Send to Editor", your file appears in the text editor. You can adjust its size and placement.

2 When you are finished, click on "Publish" and the post will immediately appear on the blog...

Publishing your post.

...and this is what it looks like:

Managing your posts.

If you need to go back and modify your post, click on "Manage" in the admin toolbar, where you can edit ① or delete ② your post.

Modifying your user profile.

You can edit your user info in the "Your Profile" part of the "Profile" section:

1 Edit your identity info (you can not change your username).

2 Update your contact info.

3 Write a description about yourself (not required).

4 Change your personal account password. After logging in for the first time, you update your password to something other than "changeme" (something you can remember). If you forget your password, contact the blog administrator.

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Getting email notifications when a new post appears

Under the "Subscriptions" part of the "Profile" section, you can choose to receive email notification when a new post appears on the blog.

You have a few options **1** for the format of the email notification.

You can also choose the categories **2** for which you wish to receive notification.

Posting to the blog via email

You may also post directly to the blog by sending an email to the blog. Here is how it works:

1 Begin a new email message addressed to: b461dac2ab@quantumcollective.org, which is the *secret* email address for The QC.

2 Enter the title of your post as the subject of the email.

3 Type in your message as you would in the text editor of Wordpress, with one minor exception: use a double backslash for tex commands, e.g.

$$[tex] \text{\textbackslash\textbackslash alpha \textbackslash\textbackslash beta \textbackslash\textbackslash gamma} [/tex]$$

4 Attach any files (e.g. pdf, txt, etc) or images (e.g. jpg, gif, png) you want to appear in your post.

5 When you are finished composing your post, send your email.

The blog checks for new emails every ten minutes. When a new one is detected from an authorized email address (i.e. from a registered user), it is posted.

Version history

01/16/06	v.2.0	Stable version attained with desired functionality.
		Added many new features using available plugins:

    - latexrender version for server w/out LaTeX - mimeTeX

    - admin bar on top of blog - WP Admin Bar 2

    - printable blog entries - WP-Print

    - subscription to comments - Subscribe to Comments

    - subscription to blog posts - Subscribe2

    - mobile blogging via email - Postie

Tweaked Impact(Switcher) style files to my liking.

Wrote a blog HOWTO.

01/05/06	v.1.5	Created Bluehost account with domain name quantumcollective.org.

Settled on blog template: Impact(Switcher).

Migrated old TypePad blog over to new site into Wordpress.

Beta testing began.

12/24/05	v.1.1	Added latexrender plugin for tex support and misc. improvements.
12/20/05	v.1.0	Created prototype blog using Wordpress running locally on my laptop.
11/03/05	v.0.1	Created TypePad blog called The Quantum Collective.